National Environmental Satellite, Data, and Information Service

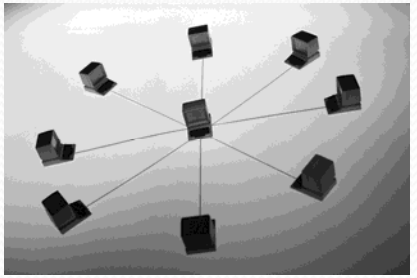
CLASS
Present and Future

Aug 15, 2012

What is CLASS

- Program
  - Program office moved to NCDC
- Software
  - Developed to archive large array data sets from satellites
- A Contract
  - DGP
- Implements OAIS-RM
- An archive
  - Evolution underway to implement services as part of an enterprise solution

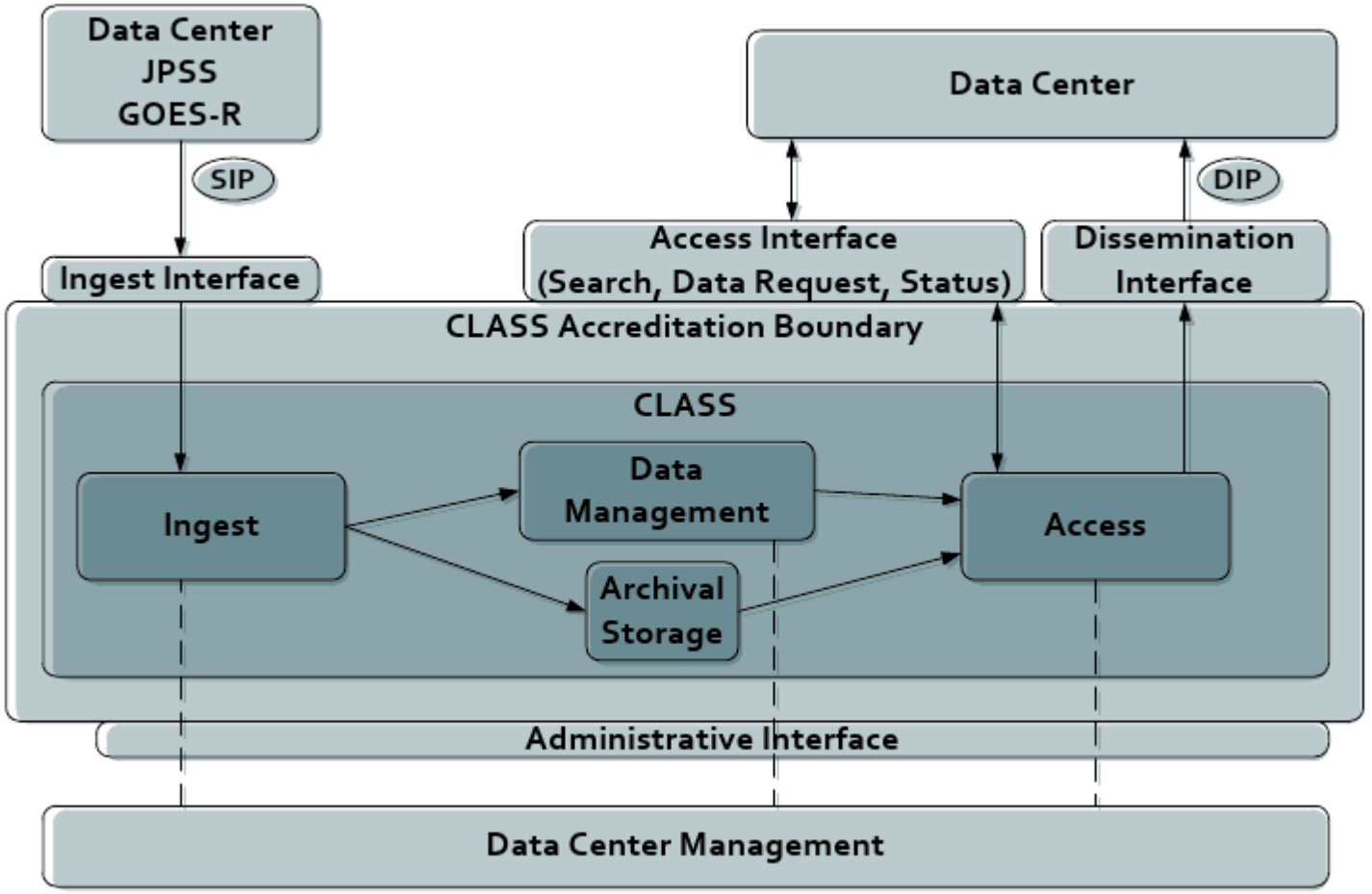
CLASS Evolution

	Gen I	Gen II	Gen III
Phase			
Description	• Landing Zone • Web Access • Satellite Archive • StoreNext Archive	• JPSS Common Ground Segment • Met Op B • G-Com • Goes-R • Data Center Migration	• Archive as a Service • HPSS based Archive • MetaData Archive •
Activities	• NSOF Archive deactivated • Linux Migration • Server Consolidation • Virtualization • Fairmont – Relocation.	• M2M development • Receipt Node development • Generic Interface design • Cloud Pilot • Middleware integration (iRods) •	• Expose DI (MetaData) • Develop Services • Ingest Generic Data Sets • HPSS
Pros/Cons	• Independent from DCs • Optimized for Satellite • Autonomous • one stop shopping • Based on Programs	• Many dependent activities • Improving access • Increasing collaboration • Establishing standards	• Develop Services as needed • Predictable costs • Extensible •

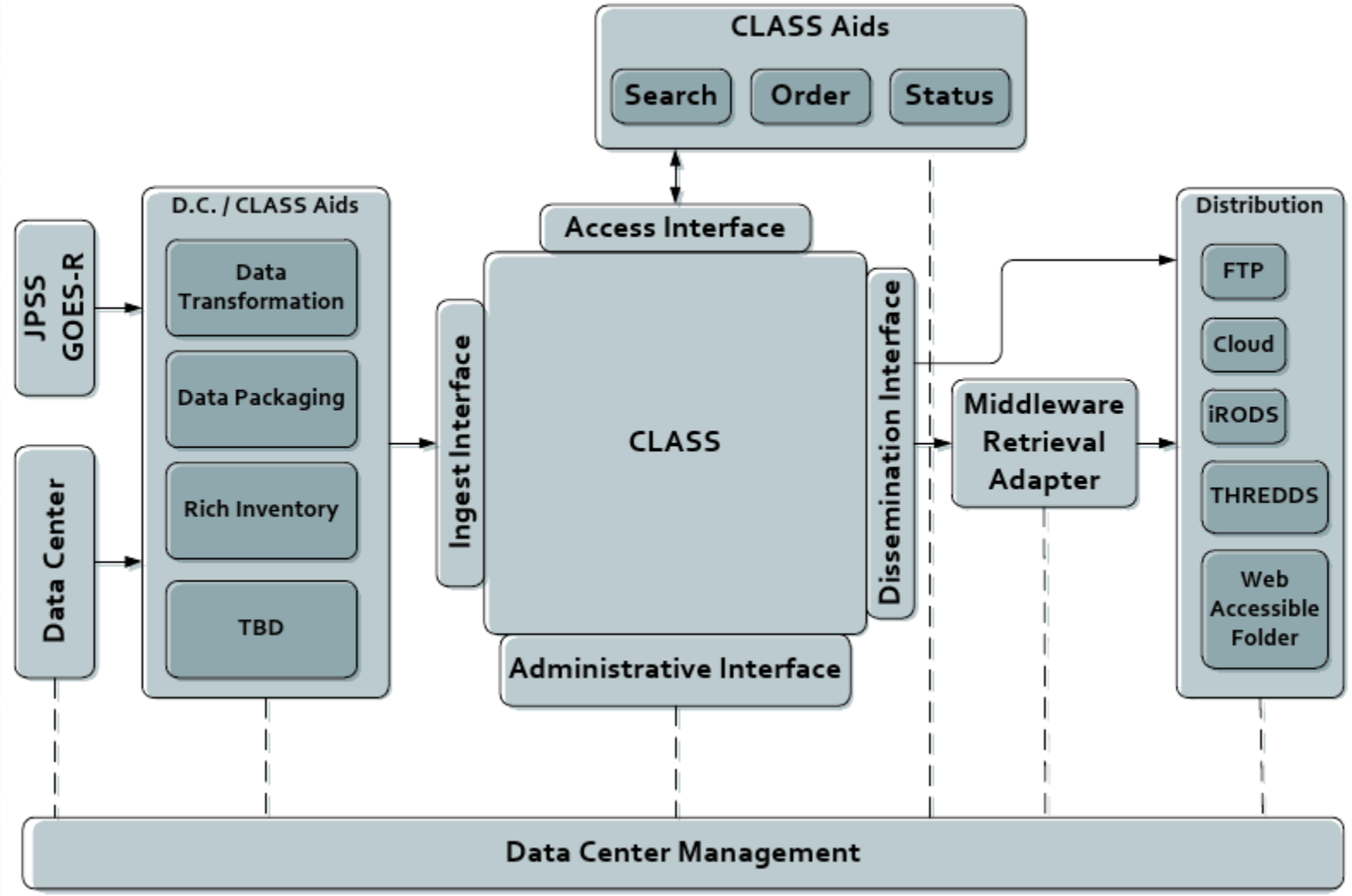
Architecture Changes

- M2M interface - development
  - Current access only via CLASS-web
    - Provides automated ordering instead of website only access
- Common Storage Service - prototype
  - Publish holdings to external storage and provide access using Cloud technologies
    - Addresses CLASS access limitations (write once, read many)
- Common Ingest Service (Gateway) - design
  - Simplify dataset configuration and ingest
    - Configure once and ingest many [datasets]
- Integrate with data centers with middleware – proof of concept
  - Implementing rules based middleware

Gen II


Data Center
JPSS
GOES-R
SIP
Ingest Interface
Data Center
DIP
Access Interface
(Search, Data Request, Status)
Dissemination
Interface
CLASS Accreditation Boundary
CLASS
Ingest
Data
Management
Archival
Storage
Access
Administrative Interface
Data Center Management

Gen III


CLASS Aids
Search
Order
Status
D.C. / CLASS Aids
Data Transformation
Data Packaging
Rich Inventory
TBD
JPSS GOES-R
Data Center
Access Interface
Ingest Interface
CLASS
Dissemination Interface
Administrative Interface
Middleware Retrieval Adapter
Distribution
FTP
Cloud
iRODS
THREDDS
Web Accessible Folder
Data Center Management

Conops

- Satellite Provider:
  - CLASS extracts DI and metadata
  - CLASS provides access via CLASS web
  - Metadata is NOT exposed
- DataCenter Provider:
  - DCs maintain metadata
  - DCs provide access
  - Metadata not shared with CLASS
- CLASS is implementing a unique identifier to share metadata and DI.
- Identify the metadata owner for each data type
  - System or process
- Identify the interface elements for ingesting and extracting metadata/DI

Ingest interface issues

- CLASS needs:
  - provider ID (NGDC, NODC, …)
  - Unique Identifier (what is format VIN,MAC,UUID etc)
  - Dataset id
- CLASS wants:
  - Location
  - Time frame
  - Data group
  - Creator id (NWS, CDR, etc)
- CLASS provides:
  - User defined fields
    - Name value pair

Enterprise role

Current

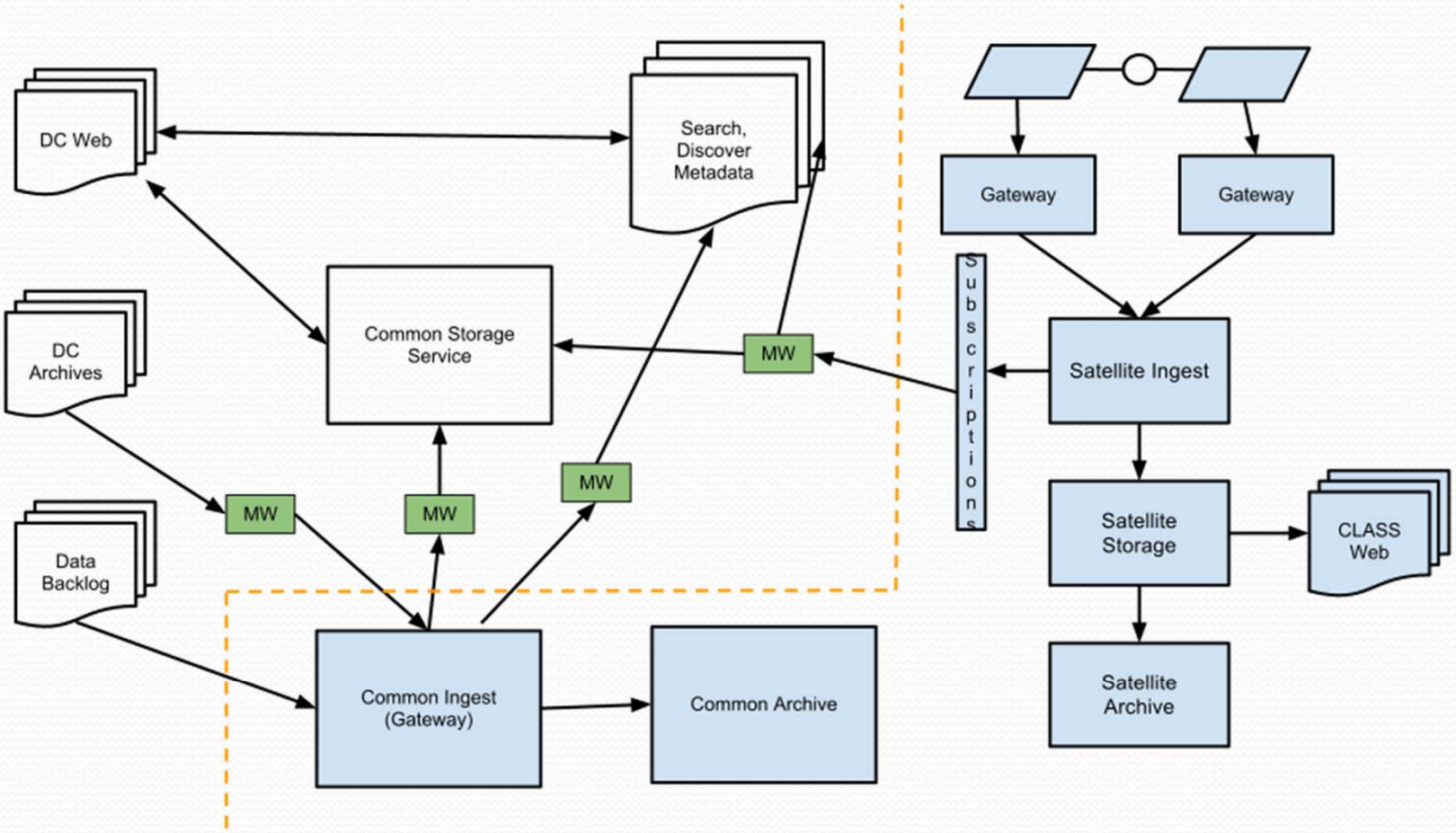
- Satellite data
  - Ingest
  - Storage
  - extract DI
  - Archive
  - Access

  Search and ordering from web site, dissemination via FTP or subscription

Future

- Satellite data
  - Ingest
  - Archive
  - M2M to provide search and order
  - common storage for access
  - **NOT metadata catalog**
- Data Center data
  - Ingest
  - Archive

Common Ingest



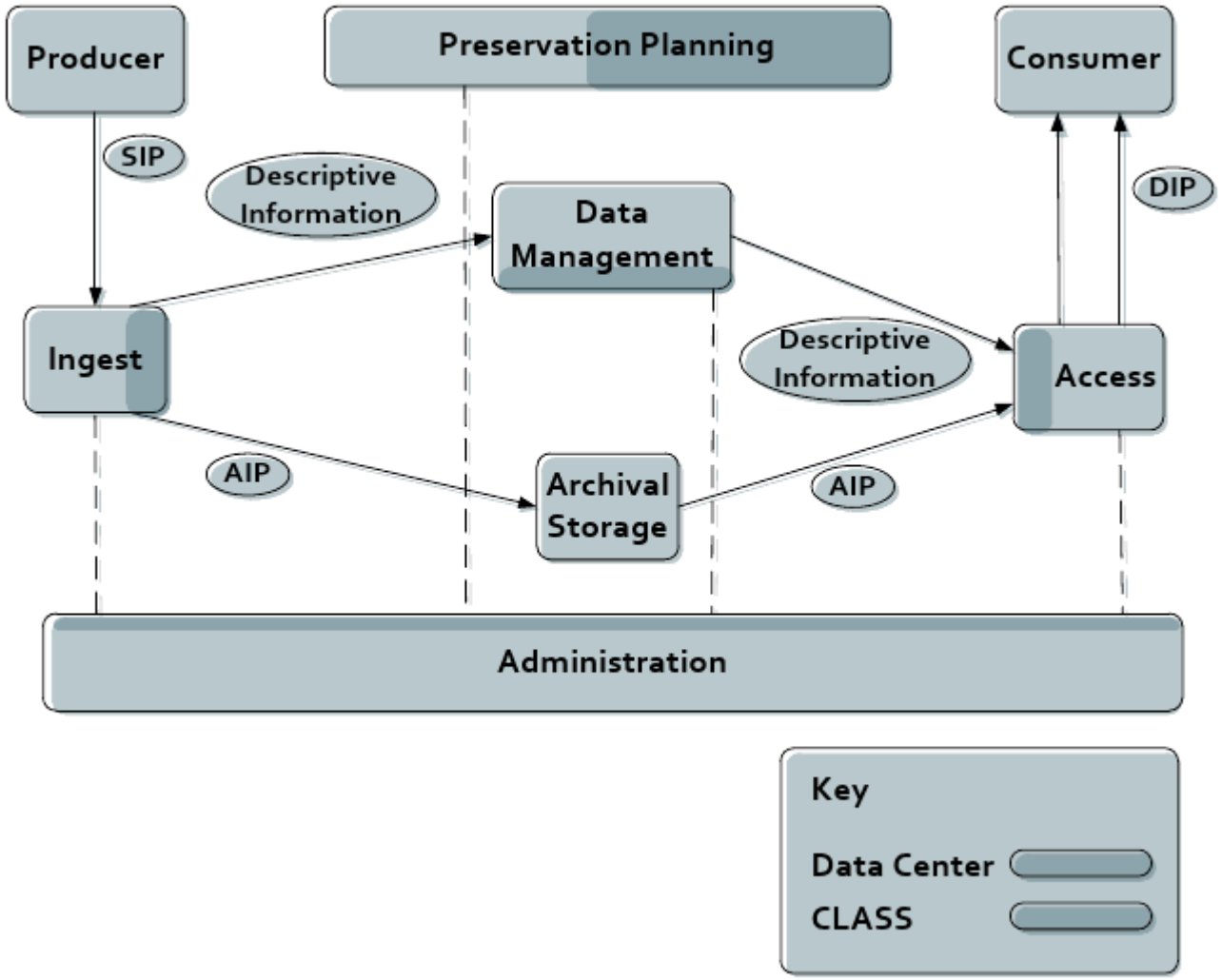
Questions?

Backup Slides

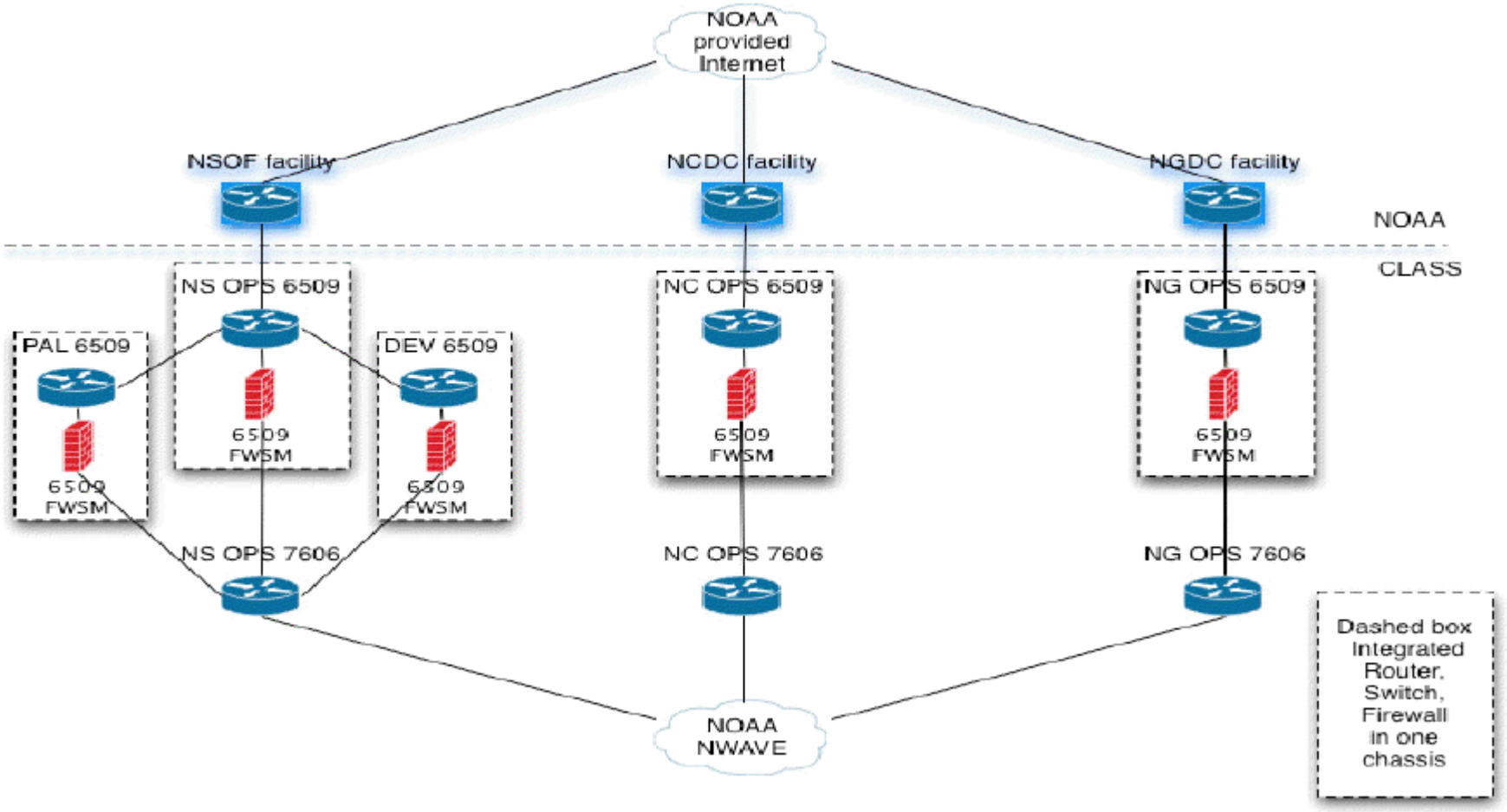
Schedule

	FY12				FY13				FY14				FY15			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Cloud Pilot (iRods) (5/1/12 – 2/30/13)																
JPSS-CGS (9/10/12 – 3/9/14)																
Data Center Migration (8/15/12 – 3/14/15)																
HPSS Migration (7/1/14 – 10/30/15)																
GOES-R M2M Interface (8/1/12 – 8/30/13)																
GOES-R Receipt Node (10/1/13 – 3/30/15)																
Services Developement (10/1/14 – 12/30/15)																
Gateway											S	S	S	S	S	S

CLASS OAIS-RM



CLASS Nodes


NOAA provided Internet
NSOF facility
NCDC facility
NGDC facility
NOAA
CLASS
NS OPS 6509
NC OPS 6509
NG OPS 6509
PAL 6509
DEV 6509
6509 FWSM
6509 FWSM
6509 FWSM
6509 FWSM
6509 FWSM
NS OPS 7606
NC OPS 7606
NG OPS 7606
NOAA NWAVE
Dashed box Integrated Router, Switch, Firewall in one chassis

CLASS Suomi-NPP Data Flow

Svalbard, Norway

C3S

IDPS

IDPS to SDS
RDRs (~1.3TB/day)

SDS

CLASS to SDS
SDRs, TDRs
EDRs, ARP, IP,
Ancillary Data,
Signature Files,
Release Packages
(~3.3 TB/day)

GRAVITE

CLASS to GRAVITE
SDRs, EDRs,
Ancillary Data,
Auxiliary Files,
Mission Notices
(~2.5TB/day)

GRAVITE to CLASS
RIPs (~1.5TB/day)

IDPS to GRAVITE
RDRs, VIIRS M Band EDR,
OMPS Auxiliary Files
(~1.4TB/day)

IDPS to CLASS
RDRs, SDRs, TDRs
EDRs, ARP, IP,
Ancillary Data,
Signature Files,
Release Packages
(~3.2TB/day)

CLASS NSOF

~4.7TB/day

CLASS NGDC

Public
Subscriptions

NWAVE 10Gb/s
replication

~4.7TB/day

CLASS NCDC

Public
Ad hoc orders

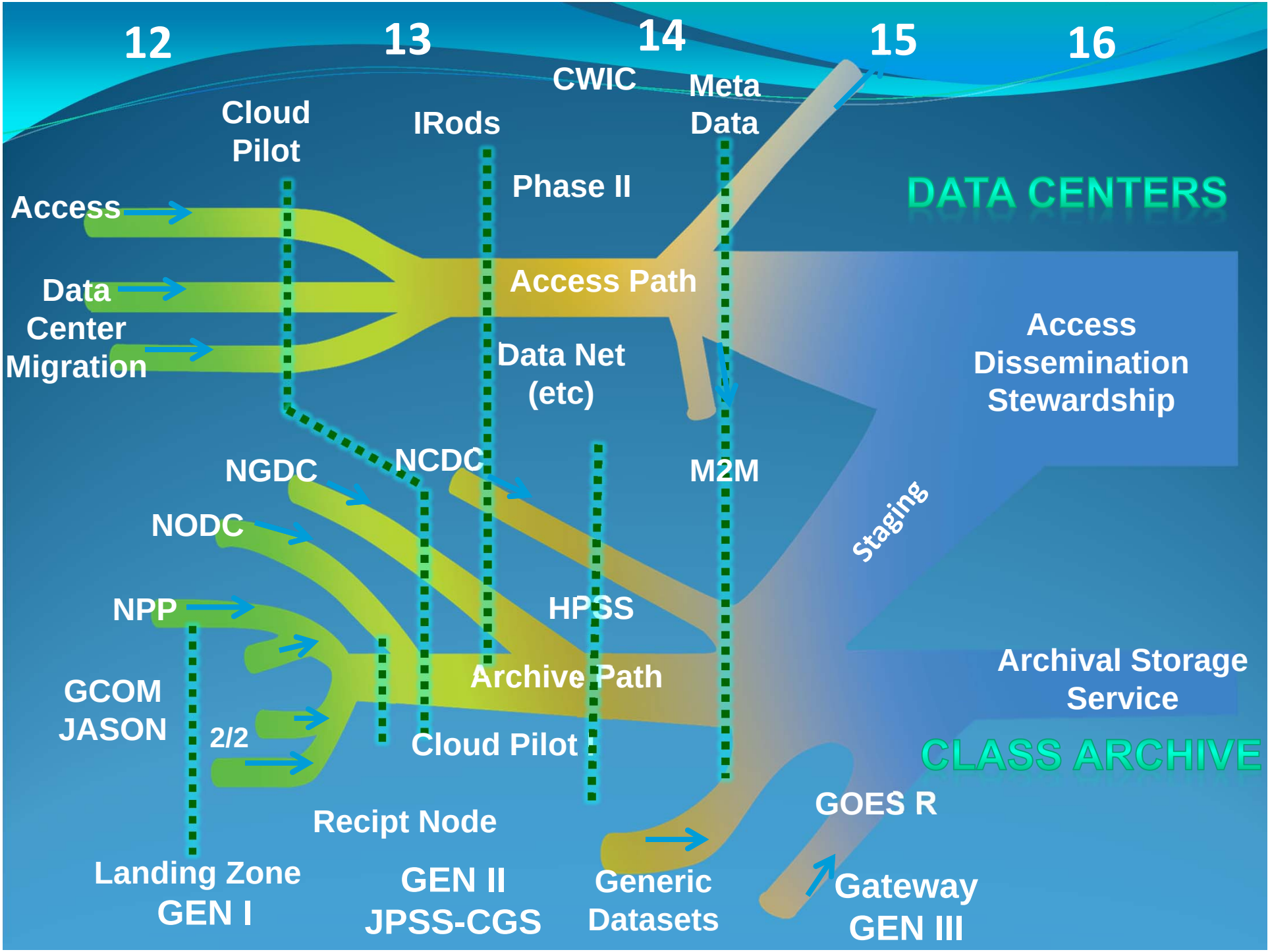
STAR

CLASS to STAR
SDRs, TDRs
EDRs, ARP, IP,
Ancillary Data,
Signature File
(~3.3 TB/day)

NPP Sensors
ATMS – Advance Technology Microwave Sounder
CrIS – Cross-track Infrared Sounder
OMPS – Ozone Mapping and Profiler Suite
VIIRS – Visible and Infrared Imaging Radiometer Suite

NPP Segments
C3S – Command, Control & Communications Segment
GRAVITE – Government Resource for Algorithm Verification, Independent Testing & Evaluation
IDPS - Interface Data Processing Segment
SDS – Science Data Segment
STAR – NOAA Center for Satellite Applications & Research

ARP – Application Related Product
EDR – Environmental Data Record
IP – Intermediate Product
RDR – Raw Data Record
RIP – Retained Intermediate Product
SDR – Sensor Data Record
TDR – Temperature Data Record


12
13
14
15
16
CWIC
Meta Data
Cloud Pilot
IRods
Phase II
DATA CENTERS
Access
Data Center Migration
Access Path
Data Net (etc)
Access Dissemination Stewardship
NGDC
NCDC
M2M
NODC
Staging
NPP
HPSS
Archive Path
Archival Storage Service
GCOM JASON
2/2
Cloud Pilot
CLASS ARCHIVE
GOES R
Recipt Node
Landing Zone GEN I
GEN II JPSS-CGS
Generic Datasets
Gateway GEN III